AP Statistics Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Activity 18.3 – Penny Ages

Get the Program “PENNY”

The program will simulate taking a sample of pennies and finding the age of each penny in years (2 means a 2 year old penny).

1. What shape do you think the distribution of the ages of the pennies would be?
2. Run the program. For sample size type 5.
3. After the program says done check L1 to see that 5 ages have been generated.
4. Create the histogram. (Xmin = 0; Xscl = 1). Can you tell the shape from this histogram.
5. Calculate the mean.



1. Run the program 9 more times (n = 5) and calculate the sample mean each time.



1. Run the program again but change the sample size to 30.
2. Create the histogram of the penny ages (Xmin = 0 and Xscl = 1). Draw it below.
3. What shape does the histogram have? Does it match your guess in #1?
4. Calculate the mean.



1. Run the program 9 more times (n = 5) and calculate the sample mean each time.



1. Enter all 10 sample means into the Quia Survey provided by Mr. Wheeles.
2. We will make a histogram of all the sample means for sample size **5** from the class. What do you guess will be the shape of this histogram?
3. We will make a histogram of all the sample means for sample size **30** from the class. What do you guess will be the shape of this histogram?

***IN CLASS -*** On the board are the histograms and summary stats for the two sample sizes(5 and 30).

1. What is the shape for the histogram of all sample means for sample size 5? Does this match your guess in #13?
2. What is the shape for the histogram of all sample means for sample size 30? Does this match your guess in #14?
3. Compare the means between the two sample distributions. What effect did increasing the sample size have on the mean of the sample distribution?
4. Compare the standard deviation between the two sample distributions. What effect did increasing the sample size have on the standard deviation of the sample distribution?
5. The actual mean for this population is 2.25 years with a standard deviation of 1.383 years.
   1. For sample size 5, what was the mean for all the sample means? How close is it to the population mean of 2.25 years?
   2. For sample size 5, what was the standard deviation for all the sample means? How close is it to the population standard deviation or 1.383 years?
   3. For sample size 30, what was the mean for all the sample means? How close is it to the population mean of 2.25 years?
   4. For sample size 30, what was the standard deviation for all the sample means? How close is it to the population standard deviation or 1.383 years?
   5. The sample of size 30 was 6 times the sample size of the first sample set. Was the standard deviation reduced by a factor of 6?